US-PAT-NO: 5630037

DOCUMENT-IDENTIFIER: US 5630037 A

TITLE: Method and apparatus for extracting and treating digital images for seamless compositing

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INVENTOR-INFORMATION:

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US-CL-CURRENT: 345/592, 345/639 , 348/592 , 348/598 , 382/164 , 382/171 , 382/282 , 382/283

ABSTRACT:

An image processing system for extracting and treating a digitized color subject image for seamless compositing against an arbitrary background includes the generation of a final control image from the image of a subject in front of a screen consisting of a range of colors. A sample of the background screen is captured and analyzed using filter kernels to determine a range of red, green and blue values which are stored in separate histograms. A first control image is generated by comparing mean histogram data with the subject image. A final control image is generated by dividing the first

control image into separate
background, foreground and fringe regions. A
treated subject image is
generated by leaking color from the local
background region into the fringe
regions of the subject image using filter kernels.
The treated image is
suitable for compositing against an arbitrary
background image. The composite
image may be touched up by using a software brush
which on each pass of the
brush expands the background region by eliminating
immediately adjacent fringe
pixels, causes other nearby fringe pixels to
increase in translucence, and
allows the boundary of the fringe region to
encroach on the foreground region.
Simultaneously, the brush may also cause fringe
pixels to absorb some of the
color of neighboring foreground pixels.

21 Claims, 20 Drawing figures

Exemplary Claim Number: 1

Number of Drawing Sheets: 12

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Brief Summary Text - BSTX (4):
Analog video techniques have existed for many
years whereby a live action
video signal may be composited against a background
of another arbitrary image
when the foreground subject is set in front of a
colored screen (typically a
green or blue screen). For example, a local news
weatherman may be composited
against a background of a weathermap when the

weatherman is actually standing
in front of a blue or green colored screen. In
some instances, a table of red,
blue and green spectra is produced, and the
background color range is
interactively selected from the table. The
composited image depicts the
weatherman in front of the weathermap while the
blue or green background is
generally eliminated. Such compositing techniques
are often referred to as
"**chroma key**" techniques.

Brief Summary Text - BSTX (5):

More recently, techniques have been developed
using digital hardware whereby
a digitized image may be stored in a framestore or
in a memory comprised of
pixels, where each pixel consists of three values
corresponding to the red,
green, and blue intensities at the appropriate
pixel location on the video
output device when the full color image is
displayed. Such techniques,
however, have several drawbacks. One drawback is
that the screen in front of
which the subject is shot must usually be either
pure green or pure blue due to
the nature of the **chroma-key** process. A second
drawback is that the screen in
front of which the subject is shot must be evenly
lit. Uneven lighting causes
uneven shading of the screen, making it difficult
for such systems to
distinguish between subject and screen.

Detailed Description Paragraph Equation - DEEQ
(13):

result=a.times.fg+(**1-a**).times.bg